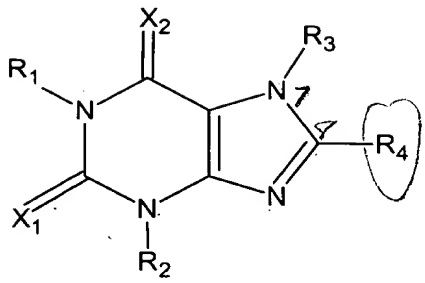
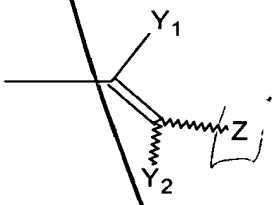


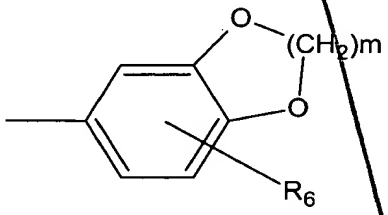
(I)

must have a ring

wherein X_1 and X_2 independently represent O or S, R_1, R_2 and R_3 independently represent hydrogen, lower alkyl, lower alkenyl or lower alkynyl; R_4 represents $-(CH_2)_n-R_5$, wherein R_5 represents a substituted or unsubstituted heterocyclic group selected from furyl, thienyl, pyrrolyl, pyranyl, thiopyranyl, pyridyl, thiazolyl, imidazolyl, pyrimidyl, triazinyl, indolyl, quinolyl, purinyl and benzothiazolyl, and n is an integer of 0 to 4, or the following group:



wherein Y_1 and Y_2 independently represent hydrogen, halogen or lower alkyl, and Z represents substituted or unsubstituted aryl, or the following group:



wherein m is an integer of 1 to 3 and R_6 represents hydrogen, hydroxy, lower alkyl, lower alkoxy, halogen, nitro or amino,

or a substituted or unsubstituted heterocyclic group selected from furyl and pyridyl; and wherein the substituted aryl and the substituted heterocyclic group have 1 to 3 independently-selected substituents selected from the group consisting of lower alkyl, hydroxy, lower alkoxy or lower alkoxy substituted with a substituent(s) selected from the group consisting of hydroxy, lower alkoxy, halogen, amino, azido, carboxy and lower alkoxycarbonyl, halogen, nitro, amino, lower alkylamino, di(lower alkyl)amino, trifluoromethyl, tri-fluoromethoxy, benzyloxy, phenyl, phenoxy, lower alkanoyl, lower alkanoyloxy, aroyloxy, aralkanoyloxy, carboxy, lower alkoxycarbonyl, lower alkylcarbamoyl, di(lower alkyl)-carbamoyl, sulfo, lower alkoxysulfonyl, lower alkylsulfamoyl and di(lower alkyl)sulfamoyl; or a pharmaceutically acceptable salt thereof, as an active ingredient.

10. (amended) A method of treating neurodegenerative disorders except for Parkinson's disease and attention deficit hyperactivity disorder, which method comprises administering an effective dose of a xanthine derivative represented by formula (I):

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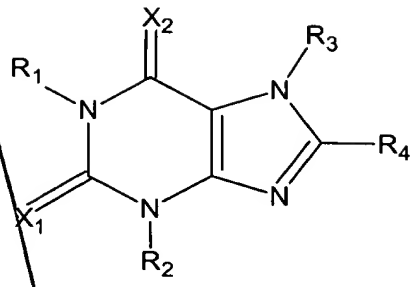
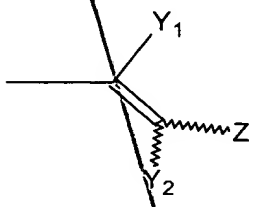
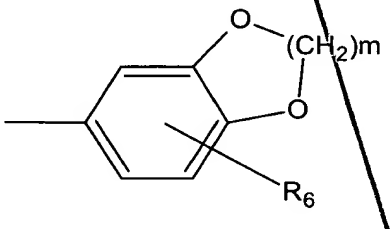


(I)

wherein X_1 and X_2 independently represent O or S, R_1, R_2 and R_3 independently represent hydrogen, lower alkyl, lower alkenyl or lower alkynyl; R_4 represents $-(CH_2)_n-R_5$, wherein R_5 represents a substituted or unsubstituted heterocyclic group selected from furyl, thienyl, pyrrolyl, pyranyl, thiopyranyl, pyridyl, thiazolyl, imidazolyl, pyrimidyl, triazinyl, indolyl, quinolyl, purinyl and benzothiazolyl, and n is an integer of 0 to 4, or the following group:



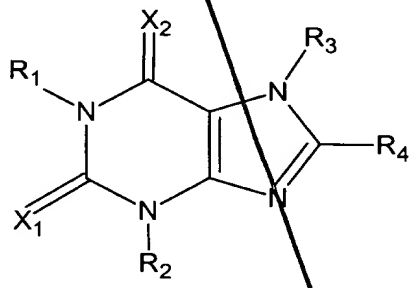
wherein Y_1 and Y_2 independently represent hydrogen, halogen or lower alkyl, and Z represents substituted or unsubstituted aryl, or the following group:



wherein m is an integer of 1 to 3 and R_6 represents hydrogen, hydroxy, lower alkyl, lower alkoxy, halogen, nitro or amino, or a substituted or unsubstituted heterocyclic group selected

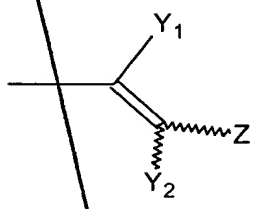
from furyl and pyridyl; and wherein the substituted aryl and the substituted heterocyclic group have 1 to 3 independently-selected substituents selected from the group consisting of lower alkyl, hydroxy, lower alkoxy or lower alkoxy substituted with a substituent(s) selected from the group consisting of hydroxy, lower alkoxy, halogen, amino, azido, carboxy and lower alkoxycarbonyl, halogen, nitro, amino, lower alkylamino, di(lower alkyl)amino, trifluoromethyl, tri-fluoromethoxy, benzyloxy, phenyl, phenoxy, lower alkanoyl, lower alkanoyloxy, aroyloxy, aralkanoyloxy, carboxy, lower alkoxycarbonyl, lower alkylcarbamoyl, di(lower alkyl)-carbamoyl, sulfo, lower alkoxysulfonyl, lower alkylsulfamoyl and di(lower alkyl)sulfamoyl; or a pharmaceutically acceptable salt thereof, as an active ingredient.

14. (amended) A method of treating Alzheimer's disease, which comprises administering an effective dose of the xanthine derivative represented by formula (I):

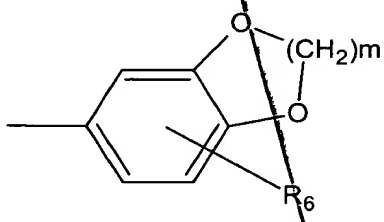


(I)

wherein X_1 and X_2 independently represent O or S, R_1, R_2 and R_3 independently represent hydrogen, lower alkyl, lower alkenyl or lower alkynyl; R_4 represents $-(CH_2)_n-R_5$, wherein R_5 represents a substituted or unsubstituted heterocyclic group, selected from furyl, thienyl, pyrrolyl, pyranyl, thiopyranyl, pyridyl, thiazolyl, imidazolyl, pyrimidyl, triazinyl, indolyl, quinolyl, purinyl and benzothiazolyl, and n is an integer of 0 to 4, or the following group:



wherein Y_1 and Y_2 independently represent hydrogen, halogen or lower alkyl, and Z represents substituted or unsubstituted aryl, or the following group:



wherein m is an integer of 1 to 3 and R_6 represents hydrogen, hydroxy, lower alkyl, lower alkoxy, halogen, nitro or amino, or a substituted or unsubstituted heterocyclic group selected from furyl and pyridyl; and wherein the substituted aryl and the substituted heterocyclic group have 1 to 3 independently-selected substituents selected from the group consisting of lower alkyl, hydroxy, lower alkoxy or lower

alkoxy substituted with a substituent(s) selected from the group consisting of hydroxy, lower alkoxy, halogen, amino, azido, carboxy and lower alkoxycarbonyl, halogen, nitro, amino, lower alkylamino, di(lower alkyl)amino, trifluoromethyl, tri-fluoromethoxy, benzyloxy, phenyl, phenoxy, lower alkanoyl, lower alkanoyloxy, aroyloxy, aralkanoyloxy, carboxy, lower alkoxycarbonyl, lower alkylcarbamoyl, di(lower alkyl)-carbamoyl, sulfo, lower alkoxysulfonyl, lower alkylsulfamoyl and di(lower alkyl)sulfamoyl; or a pharmaceutically acceptable salt thereof, as an active ingredient.